

with Figs. 7, 9 and 11 northern shells. An examination of the youngest shells that I have seen would seem to indicate that *lamellidens* may be the ancestral form as in very young *multi-dentata* the teeth are generally fused, so much so in fact that in one of two cases I had separated them as *lamellidens*; but careful focusing of the microscope brought out the fused teeth, and measurements showed the relatively larger umbilicus.

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THE NOMENCLATURE AND SYSTEMATIC POSITIONS OF SOME NORTH AMERICAN FOSSILS AND RECENT MOLLUSKS. II.

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*Planorbis cirrus* White, 1879, from the Tertiary of Wyoming, was the next year cited by the same author as though it were spelled *cirratus*. Since then the latter name has been universally, but improperly, used instead of *cirrus*.

*Physa bullata* White, 1886 (U. S. Geol. Surv., Bull. 36), from the Eocene of Utah, is preoccupied by *P. bullata* P. and M., 1838, and *P. bullata* Gould, 1855. However, on page 12 of his bulletin, and in the legend of plate 3, White used the name *bullatula* for the same species, the use of *bullata* on page 22, where it was described, perhaps being unintentional. Hence White's species should be known as *Physa bullatula*. Whether Gould's species should be renamed depends upon whether it is a valid form or a synonym of some other form, which I am now unable to determine.

*Physa carletoni* Meek, 1872, from the Cretaceous of Utah, is incorrectly referred to as *P. carltoni* by Grabau and Shimer, 1900. Such a mistake is easily made, but unfortunately there is a prior use of *carltoni* in this genus by Lea, 1869. Though confusing, I suppose the names are sufficiently distinct so that Meek's name may stand. His species has been so frequently mentioned in various reports that it would be a shame to disturb the name unless required by the rules.

*Acella haldemani* White (= *Tortacella haldemani*, in Auriculidae), from the Cretaceous of Wyoming, is preoccupied by *Lymnaea haldemani* Deshayes, 1867 (= *Acella haldemani*, accord-

ing to Baker). White's species may hereafter be known as *Tortacella wyomingensis*. To disturb a name so well known is regrettable.

*Paludina subglobosa* Emmons, 1858, from the Tertiary of North Carolina, is preoccupied by *P. subglobosa* Say, 1825. The type of Emmons' species is lost and the figure too poor for definite generic reference. Indeed, it may even be marine. However, it may sometime be recovered, and as there is no way of eliminating it from the published literature and it must be included in any complete list of described species, it should perhaps have a name. It may be known as *Vivipara* ? *emmonsi*. Conrad identified it with *V. glabra*, which is very doubtful.

Dall, (Contrib. Tert. Fauna Fla., 1892, p. 277) says *Compospleura trinodosa* Conrad=*Scalaria trigemmata* Conrad, "which is a *Goniobasis*." Harris (Bull. Amer. Paleont., III, No. 11, p. 71) places *trigemmata* in *Melania*, says probably related to "*Terebra*" *plicifera* (the quotation marks are Harris's), and omits *trinodosa* from the synonymy. I have not at hand the means for determining whether *trigemmata* is a *Melania* or a *Goniobasis*, if, indeed, it can be determined. If Dall is correct in referring it to *Goniobasis*, and if Harris is correct in supposing that it is related to *T. plicifera* Heilp., a Tertiary fossil, then it would follow that the latter is also a *Goniobasis*, in which case its specific name would be preoccupied by *Melania*=*Goniobasis plicifera* Lea, a recent species, unless the latter should be removed to some other genus, as Hannibal has done. The easiest way out of the dilemma is to leave *trigemmata* in *Melania*, where Harris placed it. I pass the puzzle on to the next fellow, with these clues as a starter.

*Limnaea (Polyrhytis) kingii* Meek, 1877, was described from beds designated as "probably Miocene," in Cache Valley, Utah. I had supposed these beds to be Pleistocene, and Hannibal has suggested the same thing, but Dr. T. W. Stanton writes me that they are now generally considered Pliocene, or at least older than the Lake Bonneville beds, because they are more disturbed, though I believe Lake Bonneville extended into Cache Valley during its greatest expansion. I believe that *Radix ampla* var. *utahensis* Call, 1884, is a synonym of *Limnaea*

*kingi* Meek. It occurs in Utah Lake and Bear Lake, both draining into Great Salt Lake, one from the south and one from the north. Obviously it could not pass from one river system to the other through Great Salt Lake as that body of water now is. Its distribution suggests that it may have passed through during the Pleistocene expansion, when its waters were freshened by overflow to the north. It probably has had a long history in the region, and there is no reason to doubt that it occurred during Pliocene time and so was contemporaneous with *kingi*, if not identical with it. As the lake at its maximum overflowed to the north, it may occur now in Port Neuf River drainage also, though Daniels and I did not find it there during a brief visit. Dr. Dall writes:

"I think your identification of the *Lymnaea* is correct. However it is to be borne in mind that the plications which led Meek to propose a genus for his species are pathological and not specific characters. They are directly due to the increase in alkaline salts in the water inhabited by the mollusks and have been imposed upon various gastropods in the same situation."

*Cyrena californica* Gabb, 1869, described from the Pliocene of California, is preoccupied by *C. californica* Prime, 1865, which is itself a synonym of *C. californiensis* Prime. Prime's species was described by Deshayes in 1854 as *Cyrena subquadrata*. That name being preoccupied, Prime changed it to *californiensis* in 1860, without description, but citing Deshayes' publication. In 1865 Prime described it as *Cyrena californica*, citing *subquadrata* Deshayes and *californiensis* Prime as synonyms. The name of Prime's species must therefore stand as *californiensis*. Dall in 1903 transferred Gabb's species to the genus *Corbicula*, subgenus *Cyanocyclas*. Under the circumstances it is unfortunate that Gabb's name should have to be displaced. I propose that it be called *Corbicula gabbiana*.

*Cyrena obliqua* Deshayes, 1824, from the Tertiary of Europe, has been placed in *Corbicula* by Vincent (Ann. Soc. Roy. Malac. Belgique, XXI, 1886, p. 136) and Taylor (Monog. L. and F.-W. Moll. Brit. Isles, No. 7, 1900, p. 413). Newton (Brit. Olig. and Eoc. Moll. in Brit. Mus., 1891, p. 57) left it in the

genus *Cyrena*. If correctly referred to *Corbicula*, it would have priority over *Corbicula obliqua* Whiteaves, 1885, from the Cretaceous of Canada. Not having access to the literature necessary for the determination of this question, I wrote to Dr. T. W. Stanton about it. He referred it to Dr. W. H. Dall, who replied as follows:

"Deshayes in his revision left *obliqua* in *Cyrena*. *Cossmann* puts it in *Corbicula*. The lateral teeth are smooth as in *Cyrena* but long as in *Corbicula*. It belongs to a small group of ovoid species which is neither typical *Cyrena* nor true *Corbicula*. Of the two attributions I regard Deshayes' as the most nearly correct, but I should include these small oval species in a distinct group from either. However, as the species has been referred at various times to *Corbicula* it would probably be best to regard the combination as preoccupying Whiteaves' name if it was made before 1885, but not otherwise."

I have no citation indicating that the combination referred to was made before 1885. Under the circumstances I feel that Deshayes' species should be left in *Cyrena* or placed in a distinct genus, and *Whiteaves'* name retained for the Cretaceous species. If anyone thinks the latter should be renamed, then it would be quite fitting to name it in honor of Whiteaves, a name that has not been used for any species of *Corbicula* as far as I can ascertain.

Some of the fossil Mollusca described by Hall in the report of the Fremont Expedition, 1845, are exceedingly troublesome. Though all assigned by Hall to marine genera, he stated that he would have considered several of them fluviatile shells except for the occurrence of *Nucula impressa* and *Cerithium fremonti* "in the same association." White, in his Review of North American Fossil Non-marine Mollusca, says they probably belong to a fresh-water fauna, and several have been definitely transferred to fresh-water genera, being now well known. Following is the list of Hall's species under discussion:

*Nucula impressa*=*Yoldia impressa*.

*Mya tellinoidea*=*Unio tellinoides*.

*Cytherea parvula*.

*Cerithium fremonti*.

*Cerithium tenerus*=*Goniobasis tenera*.

*Turbo paludinaeformis*=*Vivipara paludinaeformis*.

*Turritella bilineata*.

*Natica*? *occidentalis*.

*Pleurotoma uniangulata*.

I have been unable to locate the types of any of these species. They do not appear to be at Albany, New York, Washington or Philadelphia. The last hope seems to be the Hall material at the University of Chicago, which has not been unpacked. The latitude given for the *Mya*, *Nucula*, *Pleurotomaria*, *Cerithium tenerum*, and *C. fremonti* (Lat. 40), is incorrect, as they are definitely reported to have come from where Fremont crossed the mountains from Muddy River, which flows eastward to Muddy Creek, which flows westward into Bear River. This would be in southwestern Wyoming, above Lat. 41, probably not far from the locality of the *Turbo* and *Cerithium paludinaeformis*, which is given as Lat. 41½, instead of being 115 miles to the southward, as stated by Hall. It is not certain that these were all from the same formation or the same past locality. The *Cytherca*, *Natica* and *Turritella* are said to be from Lat. 43 N., Long. 115 W., which would place them in the Snake River Valley of southwestern Idaho, in a region occupied by freshwater Tertiary Rocks, according to Dr. Stanton.

*Nucula impressa* Hall is a *Yoldia*, and has priority over *Nucula impressa* Conrad, 1848, from the Tertiary of Oregon, which, as Dr. Dall informs me, is a *Portlandia*, and both are preoccupied by *Nucula impressa* Sowerby (Min. Conch., V, 1825), a Cretaceous shell of Europe. Hall's species may be known as *Yoldia fremonti*, and Conrad's species may be known as *Yoldia (Portlandia) astoriana*.

*Natica*? *occidentalis* Hall, a "delicate shell," is said to be based upon one "perfect specimen," the mouth of which is not entire but shows that the lip was somewhat expanded, and several casts. Hall was in doubt as to its systematic position, and if the locality given is correct, it is probably not a naticoid shell. However, the name has priority over *Natica occidentalis* Meek and Hayden, 1856, from the Cretaceous of South Dakota, for which I propose the specific name *dakotensis*.